



MachZ™

FailSafe™ PC-on-a-Chip

COMPETITIVE ANALYSIS

	MachZ PC-on-a-Chip	AMD Elan400	AMD ElanSC520	ST Microelectronics STPC Industrial
CPU Speed	33,66,100,133MHz	33, 66, 100MHz	100,133MHz	66, 80, 100MHz
L1 Cache	8K	8K	16K	8K
FPU	YES	NO	YES	YES
Fully PC Compatible	YES	NO	NO	NO
DMA Controller	8237/AT compatible 7-channels internal / 2 external	8237/AT compatible 2-channels	8237/AT compatible 4 external channels	8237/AT compatible 7-channels
Interrupt Controller	(2) 8259/AT compatible, 16 IRQs, ISA & PCI	(2) 8259/AT compatible, 8 IRQs	22 interrupts (all multiplexed except 4 PCI))	(2) 8259/AT compatible, 16 IRQs, ISA & PCI
Timer / Counters	(3) 8254 compatible	YES	YES (3)	(3) 8254 compatible
ISA BUS	YES ¹	partial	NO	multiplexed
PCI BUS	YES ¹	NO	YES	multiplexed
I²C BUS	YES ²	NO	YES	NO
USB	YES ³	NO	NO	NO
Fail Safe BOOT ROM	YES ⁴	NO	NO	NO
BIOS license included	YES ⁵	NO	NO	NO
Linux Image	YES ⁶	NO	NO	NO
RTOS w/browser	YES ⁷	NO	NO	NO
Z-TAG™ – Serial access to allow S/W upgrades at high speed and low cost	YES ⁸	NO	NO	NO
ZF-Logic™ (General Purpose Chip Select control with boundary checking)	YES ⁹	NO	NO	NO
Pulse Width Modulator	YES (up to 100KHz) ¹⁰	NO	NO	NO
External FLASH decode logic	YES	NO	YES	NO
Serial Ports	2 (16550)¹	1 (16550)	2 (16550) (1 multiplexed)	2 (1 multiplexed) (15540)
Parallel Port	YES ¹	YES	NO	multiplexed
Floppy Controller	YES ¹	NO	NO	NO
IDE	YES	NO	YES	NO
Graphics Controller	NO ¹¹	CGA	NO	SVGA
PC/AT Keyboard	YES ¹	NO	NO	multiplexed
PS2 Mouse	YES ¹	NO	NO	multiplexed
PCMCIA Controller	NO ¹²	YES (dual)	NO	YES (single)



PRELIMINARY INFORMATION

	MachZ PC-on-a-Chip	AMD Elan400	AMD ElanSC520	ST Microelectronics STPC Industrial
IrDA infrared port	YES	YES	NO	NO
DRAM Bus	16/32 bit¹³	16/32 bit	32 bit only	64 bit only
DRAM Controller	SDRAM⁶	EDO & Fast Page only	SDRAM	EDO & Fast Page only
Standard Temp Rating	33MHz (-40 to +85C) 66MHz (-40 to +85C) 100MHz (-40 to +85C) 133MHz (0-70C)	33MHz (-40 to +85C) 66MHz (-10 to +70C) 100MHz (0 to 70C w/ heatsink)	100MHz (0 to +85C) 133MHz (0 to +85C)	66, 80, 100MHz (0 to +70C with heatsink)
Power Requirement	33MHz 0.8W 66MHz 1.6W 100MHz 2.2W 133MHz 2.8W	33MHz 0.8W 66MHz 1.6W 100MHz 2.2W	100MHz 1.7W 133MHz 2.0W	80MHz 4.2W
Voltage	2.5 (core) / 3.3 (I/O) 5V tolerant	3.3	2.5(core) / 3.3 (I/O)	3.3
Advanced Power Mgmt.	YES	YES	YES	YES
Real-Time Clock	YES	YES	YES	NO
GPIO	8	32 (all multiplexed)	32 (all multiplexed)	NO
Watchdog Timer	YES (dual – H/W & S/W)¹⁴	NO	YES (dual H/W & S/W)	NO
Software Compatibility	WinCE Windows 9x Windows NT Linux Various RTOS	WinCE Windows 9x Linux	PSOS RTXC VxWorks WinCE	WinCE Windows 9x Windows NT Linux
Package	388-ball grid array	292-ball grid array	388-ball grid array	388-ball grid array
Production Life Guarantee	YES (5 years)¹⁵	NO	NO	NO

¹ ISA, PCI, Floppy, AT/Keyboard, PS2 Mouse, parallel port, serial ports with no signal multiplexing means all devices can be used simultaneously without loss of any features.

² I²C bus is a simple bi-directional 2-wire, serial data (SDA) and serial clock (SCL) bus for inter-IC control.

³ USB peripheral devices are rapidly becoming the most cost-effective way to add system functionality due to desktop volumes.

⁴ Patented Fail-Safe Boot ROM redundant boot mechanism allows full recovery even when system BIOS is corrupted due to adverse operating conditions.

⁵ Embedded BIOS included with MachZ transforms silicon hardware into a system-level component.

⁶ Full feature set of MachZ is supported in embedded Linux image included.

⁷ Embedded real-time operating system with built in browser.

⁸ Patent pending Z-Tag high-speed serial access allows field or factory software downloads at more than 100 times normal speeds.

⁹ Patent pending ZF-Logic chip select control eases x86 system integration.

¹⁰ PWM is ideal for uses such as motor control.

¹¹ Graphics controller not included in MachZ because standards change rapidly and system power consumption and complexity both increase significantly decreasing reliability.

¹² PCMCIA not included in MachZ because most such devices are too expensive to be used cost effectively in embedded applications.

¹³ With the MachZ's selectable memory bus, a fully working system can be built with 1, 2, or 4 DRAM chips. This can represent a significant cost advantage over devices with a 64-bit bus, which always require a minimum of 4 DRAM chips to operate. Additionally only the MachZ uses more commonly available SDRAM. With EDO and Fast Page DRAMs nearing end of life this can mean a significant extension of product life cycles and greater return on design investment.

¹⁴ Most reliable WDT design available for embedded applications.

¹⁵ Component obsolescence shortening product life is reduced.